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Class: CS 340

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Relational Algebra Homework

1. Select the make_name and model_name of all vehicles which have a first production year of 1976

π Make.make_name, Model.model_name (σ Model.first_production_year > 1976 (
(Vehicle \bowtie Vehicle.fk_make_id = Make.make_id Make) \bowtie Vehicle.fk_model_id = Model.model_id Model))

2. Select the make_name and model_name of all vehicles with color name Blue

π Make.make_name, Model.model_name (σ Color.name = Blue (((Vehicle \bowtie Vehicle.fk_make_id = Make.make_id Make) \bowtie
Vehicle.fk_model_id = Model.model_id Model) \bowtie Inventory.fk_vehicle_id = Vehicle.vehicle_id Inventory) \bowtie
Inventory.fk_color_id = Color.color_id Color))

3. Select the make_name, model_name and incentive amount for all vehicles with a dealer type incentive

π Make.make_name, Model.model_name, Incentive.amount (σ Incentive.type = dealer (((Vehicle \bowtie Vehicle.fk_make_id
= Make.make_id Make) \bowtie Vehicle.fk_model_id = Model.model_id Model) \bowtie Vehicle_Incentive.fk_vehicle_id = Vehicle.vehicle_id
Vehicle_Incentive) \bowtie Incentive.incentive_id = Vehicle_Incentive.fk_incentive_id Incentive))

4. Convert the following query to relational algebra:

```
SELECT Player.id, Team.name, City.name FROM Player
INNER JOIN Team ON Player.team_id = Team.id
INNER JOIN City ON Team.city_id = City.id
WHERE Player.score = 100;
```

π Player.id, Team.name, City.name (σ Player.score = 100 ((Team \bowtie Team.id = Player.team_id Player) \bowtie Team.city_id = City_id
City))

5. For problem 3 above, convert your relational algebra query into a SQL query.

```
SELECT Make.make_name, Model.model_name, Incentive.amount FROM Make
INNER JOIN Vehicle ON Vehicle.fk_make_id = Make.make_id
INNER JOIN Model ON Model.model_id = Vehicle.fk_model_id
INNER JOIN Vehicle_Incentive vc ON vc.fk_vehicle_id = Vehicle.vehicle_id
INNER JOIN Incentive inc ON inc.incentive_id = vc.fk_incentive_id
WHERE inc.type = "dealer";
```